

SUPPORT DOCUMENT - 9/2000

for the Air Operating Permit No. WA 000092-2 issued to

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DEPARTMENT OF ECOLOGY  
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## **INTRODUCTION**

This Operating Permit Support Document fulfills the operating permit rule "Statement of Basis" requirement and explains particular portions of the air operating permit for the Port Townsend Paper Corporation.

This document is not part of the operating permit for Port Townsend Paper Corporation. Nothing in this document is enforceable against the permittee, unless otherwise made enforceable by permit or order.

## **STATEMENT OF BASIS**

When the Department of Ecology issues a draft operating permit, it is required to provide a statement that sets forth the legal and factual basis for the draft permit conditions, including references to the applicable statutory or regulatory provisions. [WAC 173-401-700(8).]

### **I. Assuring Compliance With All Applicable Federal Requirements**

Certain permit conditions impose more than one emission limit or requirement that is based on two or more underlying applicable requirements. The permit lists the most stringent of multiple requirements first, then the additional limits, into single permit condition. When several requirements impose the same limit, all applicable requirements are listed with the limit.

Copies of the state Regulatory Orders and Prevention of Significant Deterioration (PSD) Permits that impose limitations and requirements on the permittee are listed in Appendix C of the permit. The Orders/Permits establish source-specific limitations. The Orders/Permits are not intended to be a separate legal source for default limitations that are based in state and federal regulations.

Ecology has preferentially relied on direct source testing as the most robust and accurate method of determining compliance and, through frequency of testing, assuring compliance. Source testing is resource and time intensive. More frequent monitoring requires the use of some sort of indirect surrogate parameter. The frequency of direct source testing has been stipulated through Orders/Permits. Ecology has attempted to reconcile frequency of monitoring with accuracy of monitoring by relying on both direct periodic source testing and more frequent indirect monitoring using surrogate parameters. Acknowledging the surrogate monitoring parameters as compliance indicators but not necessarily compliance determinants addresses the qualitative concerns regarding surrogate monitoring parameters. Where surrogate monitoring parameters have been employed, the Permit has been structured such that noncompliance with the surrogate limitation requires corrective action. Failure to take corrective action and bring the surrogate parameter within bounds constitutes noncompliance with the need to follow good operation and maintenance as required by WAC 173-405-040(10). The Permit thus combines periodic direct source testing which definitively determines compliance with surrogate monitoring requirements indicating compliance to achieve an overall

monitoring program intended to meet the Title V requirement of monitoring sufficient to assure compliance.

The frequency of both direct source testing and the application of surrogate parameters intended to indirectly infer compliance with the underlying applicable requirement is based on best professional judgment of the historical probability of exceeding the imposed limitation and the potential magnitude of an exceedence.

#### **A. Recovery furnace - federally enforceable limits**

Particulate limit compliance is monitored in two ways. A monthly source test using modified method 5 is required (A.1). The modification, designed to reduce time invested for source testing, allows for one test run of at least an hour rather than three test runs of at least one hour. Provision for frequency reduction to quarterly is made if emissions are <75% of the limit for six consecutive months. Less frequent source testing is allowed only as long as source tests continue to demonstrate emissions are <75% of the limit (A.5). Between source tests, opacity will serve as a compliance indicator. Corrective action is required when opacity excursions occur (A.4). Table 1 shows opacity and particulate data for source tests from 10/97 through 9/98.

Opacity limit compliance is continuously monitored with a COM (A.2). Additionally, visual tests using EPA Method 9 can be run.

SO<sub>2</sub> limit compliance is monitored monthly with a modified Method 6 source test (A.3). The modification, designed to reduce time invested for source testing, allows for one test run of at least an hour rather than three test runs of at least one hour. Provision for frequency reduction to quarterly is made if emissions are <75% of the limit for six consecutive months. Less frequent source testing is allowed only as long as source tests continue to demonstrate emissions are <75% of the limit (A.5). Table 1 includes SO<sub>2</sub> data for source tests from 10/97 through 9/98. The low concentration of SO<sub>2</sub> compared to the limit (all test results <40% of the limit during the time period), along with the composition of the black liquor being burned adequately assures compliance between source tests.

Table 1 - Recovery Furnace Data

| Month | Particulates<br>(gr/dscf @ 8% O <sub>2</sub> ) | Opacity<br>(%) | SO <sub>2</sub><br>(ppm) |
|-------|--|----------------|--------------------------|
| Limit | 0.08   | 35             | 200                      |
| 10/97 | 0.030  | 11             | 17.5                     |
| 11/97 | 0.010  | 13             | 2.7                      |
| 12/97 | 0.012  | 12             | 11.2                     |
| 1/98  | 0.007  | 13             | 0.4                      |
| 2/98  | 0.009  | 8              | 0.9                      |
| 3/98  | 0.022  | 13             | 1.3                      |
| 4/98  | 0.015  | 8              | 0.9                      |
| 5/98  | 0.004  | -              | 35.1                     |
| 6/98  | 0.006  | 5              | 13.9                     |
| 7/98  | 0.007  | 7              | 0.4                      |
| 8/98  | 0.006  | 5              | 76.9                     |
| 9/98  | 0.019  | 4              | 23.7                     |

A lower state limit on the recovery furnace is not federally enforceable. The lower limit was originally issued under authority of WAC 173-400-131 which is not part of the federally approved SIP. WAC 173-400-131 addresses emission reduction credits.

#### **B. Smelt Dissolver Tank - federally enforceable limits**

Particulate limit compliance is monitored in two ways. A monthly source test using modified method 5 is required (B.1). The modification, designed to reduce time invested for source testing, allows for one test run of at least an hour rather than three test runs of at least one hour. Provision for frequency reduction to quarterly is made if emissions are <75% of the limit for six consecutive months. Less frequent source testing is allowed only as long as source tests continue to demonstrate emissions are <75% of the limit (B.4). Between source tests, opacity will serve as a compliance indicator. Corrective action is required when scrubber shower flow rate falls below a set level (B.3). Table 2 shows particulate data for source tests from 10/97 through 9/98 with the scrubber shower flow rate meeting the permit requirement.

Table 2 - Smelt Dissolver Tank Data

| Month | Particulates<br>(lbs/ton BLS) |
|-------|-------------------------------|
| Limit | 0.3                           |
| 10/97 | 0.178                         |
| 11/97 | 0.141                         |
| 12/97 | 0.164                         |
| 1/98  | 0.211                         |
| 2/98  | 0.155                         |
| 3/98  | 0.211                         |
| 4/98  | 0.231                         |
| 5/98  | 0.236                         |
| 6/98  | 0.176                         |
| 7/98  | 0.269                         |
| 8/98  | 0.151                         |
| 9/98  | 0.247                         |

Opacity limit compliance is continuously monitored by monitoring to assure the scrubber shower flow rate is adequate (B.2). Additionally, visual tests using EPA Method 9 can be run.

**C. Lime Kiln - federally enforceable limits**

Particulate limit compliance is monitored in two ways. A monthly source test using modified method 5 is required (C.1). The modification, designed to reduce time invested for source testing, allows for one test run of at least an hour rather than three test runs of at least one hour. Provision for frequency reduction to quarterly is made if emissions are <75% of the limit for six consecutive months. Less frequent source testing is allowed only as long as source tests continue to demonstrate emissions are <75% of the limit (C.6). Between source tests, opacity will serve as a compliance indicator. Corrective action is required when venturi pressure drop falls below a set level (C.5). Table 3 shows particulate data for source tests from 10/97 through 9/98 with the scrubber pressure drop meeting the permit requirement.

Table 3 - Lime Kiln Data

| Month | Particulates<br>(gr/dscf @ 10% O <sub>2</sub> ) |
|-------|---|
| Limit | 0.13  |
| 10/97 | 0.042   |
| 11/97 | 0.028   |
| 12/97 | 0.035   |
| 1/98  | 0.021   |
| 2/98  | 0.030   |
| 3/98  | 0.030   |
| 4/98  | 0.019   |
| 5/98  | 0.043   |
| 6/98  | 0.025   |
| 7/98  | 0.024   |
| 8/98  | 0.036   |
| 9/98  | 0.056   |

Opacity limit compliance is continuously monitored by monitoring to assure the scrubber pressure drop is adequate (C.2). Additionally, visual tests using EPA Method 9 can be run.

SO<sub>2</sub> limit compliance is monitored in two ways. A monthly source test using modified method 6 is required (C.3). The modification, designed to reduce time invested for source testing, allows for one test run of at least an hour rather than three test runs of at least one hour. Provision for frequency reduction to quarterly is made if emissions are <75% of the limit for six consecutive months. Less frequent source testing is allowed only as long as source tests continue to demonstrate emissions are <75% of the limit (C.6). Between source tests, scrubber operation will serve as a compliance indicator. Corrective action is required when scrubber parameters do not meet specified criteria (C.7). A one year study of source test data collected with the scrubber operating is required to assure venturi pressure drop serves as an adequate indicator of SO<sub>2</sub> limit compliance (C.7a).

TRS limit compliance with a New Source Performance Standards (NSPS) limit is continuously monitored with a CEM (C.4). Although the lime kiln was built before the NSPS cut-off date, the NSPS limit applies because NCGs from units constructed after the NSPS cut-off date are burned in the lime kiln. Other lime kiln TRS limits are not federally enforceable because the applicable portions of the state regulations which serve as a basis for the limits are not part of the federally approved SIP (C.9a).

#### **D. Power Boiler #10 - federally enforceable limits**

Particulate limit compliance is monitored in two ways. A monthly source test using modified method 5 is required (D.1). The modification, designed to reduce time invested for source testing, allows for one test run of at least an hour rather than three test runs of at least one hour. One year after permit issuance, provision

for frequency reduction to quarterly is made if emissions are <75% of the limit for six consecutive months. Less frequent source testing is allowed only as long as source tests continue to demonstrate emissions are <75% of the limit (D.7). Between source tests, opacity will serve as a compliance indicator. Corrective action is required when scrubber parameters do not meet specified criteria (D.6). A one year study of source test data collected with the alternative opacity parameter limits in effect is required to assure opacity serves as an adequate indicator of particulate compliance (D.6a).

Opacity limit compliance is continuously monitored by monitoring to assure the quench water flow, scrubber water flow, and air flow are adequate (D.2). Requiring both air and water flow monitoring is unusual, but necessary in this case due to the unique pollution control device used. The device requires water injection for particulate capture and air injection to assure proper liquid/particulate contact. The monitoring program included in the permit is an EPA approved alternative monitoring program for NSPS compliance. Additionally, visual tests using EPA Method 9 can be run.

SO<sub>2</sub> limit compliance is continuously monitored by monitoring sulfur content of fuel (D.3). Only fuel with a sulfur content less than a set maximum is fired. The monitoring program included in the permit is Ecology approved. EPA has not yet approved a monitoring program. PTPC submitted their request for EPA approval on 2/27/98. The Ecology approved program will be modified as necessary to conform to the EPA approved program at such time when EPA approves a program (D.8). Calculations provided in appendix A demonstrate the NSPS SO<sub>2</sub> limit is most stringent and is met by meeting the fuel requirement.

NO<sub>x</sub> limit compliance is continuously monitored with a CEM (D.4).

#### **E. Package Boiler - federally enforceable limits**

Particulate and particulates <10 microns in diameter limit compliance is monitored in two ways. A monthly source test using EPA method 5 is required (E.1a and E.1b). Because of the intermittent operation of the unit, a month is defined as 216 hours of operation in any one month or cumulative operation of 720 hours since the last monthly test (Facility-Wide General Requirement 22). The title 5 permit also includes calendar year annual mass PM and PM<sub>10</sub> limits as specified in the package boiler PSD permit.

Opacity limit compliance is continuously monitored with a COM (E.2). Additionally, visual tests using EPA Method 9 can be run.

SO<sub>2</sub> limit compliance is continuously monitored by monitoring sulfur content of fuel (E.3). Only fuel with a sulfur content less than a set maximum is fired. The monitoring program included in the permit is as specified by NSPS requirements. PTPC submitted their request for EPA approval of an alternative monitoring program on 12/23/97. The permit provides for acceptance of an EPA approved alternative monitoring plan should EPA approve the PTPC request. A performance



test requirement that has been satisfied is not included in the title 5 permit.

NOx limit compliance is continuously monitored with a CEM (E.4).

Fuel consumption limit compliance is continuously monitored with a fuel meter (E.5).

Fuel supply limit compliance is continuously monitored by analyzing each fuel shipment received (E.6). In accordance with reduced monitoring requirements specified in Order No. 97AQ-I030, the permit specifies calcium and copper monitoring of one fuel shipment per permit cycle rather than all fuel shipments.

CO and VOC limit compliance is continuously monitored with proper unit operation and maintenance (E.7 & E.8). The appropriate sections of the PTPC operation and maintenance program are included in the permit (appendix B).

#### **F. Power Boiler #2 - federally enforceable limits**

Operation limit is continuously monitored by logging hours and purpose of operation (F.1). "Use only as back-up for NCG incineration" includes firing hours for burning NCGs and operation related to firing necessary for unit maintenance.

Particulate limit is continuously monitored by using opacity as a compliance indicator (F.2). Because the unit is allowed to operate a maximum of 200 hours on an annual basis (2.3% of the time), additional monitoring is not required.

Opacity limit is continuously monitored by unit operation with a specified burner type (F.2). Unit operation is infrequent. Ecology observed a 1987 start-up and concluded that using the burners, the unit can be started without significant visual emissions. Additionally, visual tests using EPA Method 9 can be run.

SO<sub>2</sub>, fuel sulfur, and other fuel supply limit compliance is monitored by monitoring fuel shipments (F.4 & F.5). In accordance with reduced monitoring requirements specified in Order No. 97AQ-I030, the permit specifies calcium and copper monitoring of one fuel shipment per permit cycle rather than all fuel shipments. Only fuel with parameters less than the limits is fired.

#### **G. Digester, Multiple-effect Evaporator, Condensate Stripper System - federally enforceable limits**

TRS limit is continuously monitored by continuously monitoring lime kiln TRS emissions (G.1). TRS emissions from units not covered by NSPS are not federally enforceable because the applicable portions of the state regulations are not part of the federally approved SIP. (G.2).

#### **H. Millwide Limits - federally enforceable limits**

Millwide limits compliance is demonstrated by calculations for daily and yearly emissions as required in the permit (H.1 - H.6). Data for calculations comes from continuous monitoring, source tests, production rates, and emission factors.

Compliance with the particulate, VOC, and CO daily limits is demonstrated by compliance with the annual limits. Daily maximum emissions were estimated using annual emission and production data (Table 4). The daily maximum emission estimates are 47% or less of the daily limit. For particulate, VOC, and CO; demonstration of compliance with the annual limits serves as demonstration of compliance with the daily limits as long as annual emissions are less than 60% of the annual limit.

Table 4 - Millwide Emissions

|             | Annual emissions  |                      |                   |                      | Limit |
|-------------|-------------------|----------------------|-------------------|----------------------|-------|
|             | 1996<br>(tons/yr) | 1996<br>(% of limit) | 1997<br>(tons/yr) | 1997<br>(% of limit) |       |
| Particulate | 225               | 31                   | 247               | 34                   | 729   |
| VOC         | 48                | 26                   | 51                | 28                   | 182   |
| CO          | 1733              | 28                   | 1797              | 29                   | 6204  |

|             | Maximum daily emissions* |                      |                   |                      | Limit |
|-------------|--------------------------|----------------------|-------------------|----------------------|-------|
|             | 1996<br>(lbs/day)        | 1996<br>(% of limit) | 1997<br>(lbs/day) | 1997<br>(% of limit) |       |
| Particulate | 1825                     | 41                   | 2111              | 47                   | 4500  |
| VOC         | 389                      | 39                   | 435               | 43                   | 1010  |
| CO          | 14053                    | 41                   | 15362             | 45                   | 34500 |

|         | Kraft Production   |                    |                    |                    |
|---------|--------------------|--------------------|--------------------|--------------------|
|         | 1996<br>(tons/day) | 1996<br>(% of max) | 1997<br>(tons/day) | 1997<br>(% of max) |
| Average | 513                | 70                 | 496                | 67                 |
| Maximum | 728                |                    | 742                |                    |

\* maximum daily emissions are estimated using the ratio of maximum kraft production to average production, times annual production in pounds per year divided by 350 operating days per year.

### Facility-Wide General Requirement Condition 8

Permit Condition 8 is the generic opacity limitation from WAC 173-405-040(6) which addresses kraft mills. Permit Conditions 9 and 12 work together to assure compliance with Condition 8 by requiring, first, that facility equipment be maintained and operated "in a manner consistent with good air pollution control practice" and, second, that the permittee record and promptly respond to complaints received or possible noncompliance noticed by facility staff. Ecology believes that this is a practical and effective way to assure compliance because the emission units covered by this condition do not have control devices that can be monitored and they have very low risk of

producing visible emissions except during process upsets. The mill is staffed around the clock and all staff are trained to notice and report unusual conditions, such as those associated with upsets. It is a violation of the permit to fail to take corrective action when an instance of possible noncompliance has been reported and found to be valid. Ecology believes that imposing additional monitoring such as a weekly visual inspection would have little value in identifying noncompliance and would, by presence, possibly convey a false sense of compliance.

#### **Facility-Wide General Requirement Condition 10**

Permit Condition 10 is the generic SO<sub>2</sub> limitation from WAC 173-405-040(11) which addresses kraft mills. SO<sub>2</sub> emissions are a concern from combustion sources. At PTPC, combustion sources include power boilers 2 & 10, the package boiler, the recovery furnace, and the lime kiln. SO<sub>2</sub> emissions from each of these units are addressed in the appropriate subsection for each individual unit. Ecology has not imposed monitoring for units unlikely to have a reasonable potential of exceeding SO<sub>2</sub> emission limits.

Surrogate monitoring for intervals between direct SO<sub>2</sub> testing was not imposed because in practice mills do not adjust operating parameters to minimize SO<sub>2</sub> emissions. There are no control devices or control strategies to allow this. Instead, SO<sub>2</sub> emissions are largely a function of equipment and process design. The nature of the kraft process is optimized by system stability and continuity. Ecology has no professional basis to believe that process parameters fluctuate to a degree that results in SO<sub>2</sub> emissions approaching the 1000 ppm limit and thus warranting surrogate monitoring.

#### **Facility-Wide General Requirement Condition 11**

Permit condition 11 consists of two parts. The first part is an inclusion of WAC 173-400-105(5)(h) which allows that monitoring and reporting requirements may be temporarily lifted during periods of monitoring system malfunction provided the permittee adequately explain such periods.

The second part of condition 11 is based on what Ecology considers an unlikely but possible scenario where recorded monitoring data is simply lost. Ecology will allow a 90% recovery rate for monitoring data if the permittee provides an adequate explanation for the cause of the lost data. Ecology expects the permittee to make every reasonable effort to maintain the integrity of all monitoring results. An allowance is specified for missing monitoring results under certain conditions so that these defined conditions are not defined as "violations," thus reducing the administrative burden on the source and the permitting authority.

#### **Facility-Wide General Requirement Condition 22**

Because of the intermittent nature of package boiler unit operation and possible down time of other units, monthly and quarterly

monitoring is further defined in this condition. The condition specifies when monitoring is required during periods when unit operation is less than continuous.

## **II. Insignificant Emission Units**

The facility-wide general requirements apply to the whole facility, including insignificant emission units and activities (IEUs), as required by the operating permit rule. The rule states, however, that IEUs are not subject to monitoring requirements unless the generally applicable requirements in the State Implementation Plan (SIP) impose them. [WAC 173-401-530(2)(c)]. The Washington SIP does not impose any specific monitoring-related requirements for the facility-wide requirements for IEUs at this source. The permit, therefore, does not require any testing, monitoring, reporting, or recordkeeping for insignificant emission units or activities.

## **III. Regulatory Orders**

The permittee is currently subject several regulatory orders. Copies of the orders are provided in Appendix C of the Title 5 permit.

An important issue regarding any Title V permit is the basis of authority for the applicable requirements. This is particularly true regarding monitoring and reporting requirements. The basis of authority is used to determine federal or state-only applicability. Many of the applicable requirements come from orders issued by Ecology. With the permittee's agreement the issue of state-only or federal applicability was put aside as it was agreed to rely entirely on WAC 173-401-615 as the basis of authority for the type and frequency of monitoring. WAC 173-401-615 requires monitoring and recordkeeping sufficient to assure compliance with the terms and conditions of the permit. This regulation is federally enforceable. Monitoring and recordkeeping requirements based on this regulation are federally enforceable.

## APPENDIX A - CALCULATIONS

### Formulas

from 40CFR Part 60.45(e)(1)

$$E \left( \frac{lb}{mmBtu} \right) = C \left( \frac{lb}{dscf} \right) \times F \left( \frac{dscf}{mmBtu} \right) \times \left( \frac{20.9}{(20.9 - \%O_2)} \right)$$

$$C \left( \frac{lb}{dscf} \right) = \{conc \ (ppm) \times [(2.59 \times 10^{-9}) \times M \left( \frac{lb}{lb-mole} \right)] \left( \frac{lb}{dscf \cdot ppm} \right)\}$$

$$E \left( \frac{lb}{mmBtu} \right) = \{conc \ (ppm) \times \{[(2.59 \times 10^{-9}) \times M \left( \frac{lb}{lb-mole} \right)] \left( \frac{lb}{dscf \cdot ppm} \right)\} \times F \left( \frac{dscf}{mmBtu} \right) \times \left( \frac{20.9}{(20.9 - \%O_2)} \right)\}$$

### F Factors

from 40 CFR, Part 60, App. A, Method 19

$F_d = 9600$  dscf/mmBtu for wood bark

$F_d = 9240$  dscf/mmBtu for wood

$F_d = 9190$  dscf/mmBtu for residual oil

### Power Boiler #10 - SO<sub>2</sub>

NSPS limit (0.8 lb/mmBtu) < WAC limit (1000 ppm @ 7% O<sub>2</sub>).

$$E \left( \frac{lb}{mmBtu} \right) = \{conc \ (ppm) \times \{[(2.59 \times 10^{-9}) \times M \left( \frac{lb}{lb-mole} \right)] \left( \frac{lb}{dscf \cdot ppm} \right)\} \times F \left( \frac{dscf}{mmBtu} \right) \times \left( \frac{20.9}{(20.9 - \%O_2)} \right)\}$$

$$0.8 \left( \frac{lb}{mmBtu} \right) = \{conc \ (ppm) \times \{[(2.59 \times 10^{-9}) \times 64 \left( \frac{lb}{lb-mole} \right)] \left( \frac{lb}{dscf \cdot ppm} \right)\} \times 9190 \left( \frac{dscf}{mmBtu} \right) \times \left( \frac{20.9}{(20.9 - 7)} \right)\}$$

$$conc \ (ppm) = 350 \ ppm \ @ \ 7\% \ O_2$$

$$so, [0.8 \left( \frac{lb}{mmBtu} \right) \cong 350 \ ppm \ @ \ 7\% \ O_2] < [1000 \ ppm \ @ \ 7\% \ O_2]$$

Note: the F factor for oil was used since the oil is the source of most of the S.

Compliance demonstration meeting 0.8 lb/mmBtu limit using fuel  $\leq 0.76\%$  sulfur by weight

$$\text{conc (ppm)} = \frac{0.0076 \left( \frac{\text{lb S}}{\text{lb oil}} \right) \times 2 \left( \frac{\text{lb SO}_2}{\text{lb S}} \right) \times \frac{385 \text{ dscf SO}_2}{64 \text{ lb SO}_2}}{0.0189 \left( \frac{\text{mmBtu}}{\text{lb oil}} \right) \times 9190 \left( \frac{\text{dscf}}{\text{mmBtu}} \right)} \times 10^6 \times \left( \frac{20.9 - 7}{20.9} \right) = 350 \text{ ppm @ } 7\% \text{ O}_2$$

so,  $[0.76\% \text{ S by weight} \cong 350 \text{ ppm @ } 7\% \text{ O}_2] = [350 \text{ ppm @ } 7\% \text{ O}_2 \cong 0.8 \text{ lb/mmBtu}]$

Note: assumes all S comes from the fuel and all S in the fuel becomes SO<sub>2</sub>.

Compliance demonstration meeting 1000 ppm @ 7% O<sub>2</sub> limit using fuel  $\leq 2\%$  sulfur by weight

$$\text{conc (ppm)} = \frac{0.02 \left( \frac{\text{lb S}}{\text{lb oil}} \right) \times 2 \left( \frac{\text{lb SO}_2}{\text{lb S}} \right) \times \frac{385 \text{ dscf SO}_2}{64 \text{ lb SO}_2}}{0.0178 \left( \frac{\text{mmBtu}}{\text{lb oil}} \right) \times 9190 \left( \frac{\text{dscf}}{\text{mmBtu}} \right)} \times 10^6 \times \left( \frac{20.9 - 7}{20.9} \right) = 980 \text{ ppm @ } 7\% \text{ O}_2$$

Note: assumes all S comes from the fuel and all S in the fuel becomes SO<sub>2</sub>.

### **Lime Kiln - SO<sub>2</sub>**

Compliance demonstration meeting 500 ppm @ 10% O<sub>2</sub> limit using fuel  $\leq 0.5\%$  sulfur by weight

$$\text{conc (ppm)} = \frac{0.005 \left( \frac{\text{lb S}}{\text{lb oil}} \right) \times 2 \left( \frac{\text{lb SO}_2}{\text{lb S}} \right) \times \frac{385 \text{ dscf SO}_2}{64 \text{ lb SO}_2}}{0.0189 \left( \frac{\text{mmBtu}}{\text{lb oil}} \right) \times 9190 \left( \frac{\text{dscf}}{\text{mmBtu}} \right)} \times 10^6 \times \left( \frac{20.9 - 10}{20.9} \right) = 180 \text{ ppm @ } 10\% \text{ O}_2$$

so,  $[0.5\% \text{ S by weight} \cong 180 \text{ ppm @ } 10\% \text{ O}_2] < [500 \text{ ppm @ } 10\% \text{ O}_2]$

Note: assumes all S comes from the fuel and all S in the fuel becomes SO<sub>2</sub>.

## **APPENDIX B - RESPONSE TO COMMENTS**

During the public comment period one comment was received. The comment came from PTPC and concerns copper and calcium monitoring of fuel supply shipments for the package boiler and power boiler #2 (conditions E.11 and F.5). Copper and calcium fuel supply limits for the package boiler and power boiler #2 are included in Order DE 97AQ-I030. The order also included monitoring requirements for the first year after permit issuance. The first year after order issuance has passed. Thus, presently the order specifies fuel supply limits for copper and calcium and no monitoring requirements.

PTPC commented that because monitoring was only required for the first year after order issuance, no further copper or calcium monitoring should be required. WAC 173-401-615(1)(b) requires periodic monitoring within an air operating permit sufficient to yield reliable data where an applicable requirement does not require periodic testing or monitoring. Because the existing order does not have periodic monitoring requirements for the copper and calcium limits, Ecology assigned appropriate monitoring for the two elements in the air operating permit. Appropriate monitoring for copper and calcium in the package boiler and power boiler #2 fuel supply was determined to be once per permit cycle. The once per permit cycle monitoring frequency will be retained in the air operating permit and WAC 173-401-615(1)(b) will be added to the citations in conditions E.11 and F.5 as an applicable requirement for package boiler and power boiler #2 copper and calcium fuel supply monitoring.